

WHAT IS CLAIMED IS:

1. A method of examining electrodes of a Plasma Display Panel (PDP) using frequency characteristics, the PDP being
5 constructed so that upper and lower panels, on which a plurality of electrodes are horizontally or vertically printed, are combined with each other, comprising the steps of:

a) converting target PDP electrodes printed on each of
10 the panels to a transmission line structure;

b) applying an examination signal with a plurality of frequencies to the target PDP electrodes converted to the transmission line structure and then detecting amplitudes and phases according to frequencies of an examination signal
15 overlapped with a reflection wave reflected from a first end of a corresponding PDP electrode; and

c) determining whether the target PDP electrodes are defective by analyzing the detected amplitude and phase characteristics according to frequencies.

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2. The PDP electrode examination method according to claim 1, wherein the step a) comprises the steps of:

attaching a conduction plate to a surface of the panel opposite to a surface on which the target PDP electrodes are
25 printed; and

grounding the attached conduction plate to form a ground plane.

3. The PDP electrode examination method according to
5 claim 1, wherein the step a) comprises the steps of:

forming an impedance adjustment layer made of dielectric material on a surface of the panel on which the target PDP electrodes are formed;

attaching a conduction plate to a bottom of the impedance
10 adjustment layer; and

grounding the conduction plate and using the conduction plate as a ground plane.

4. The PDP electrode examination method according to
15 claim 1, wherein the step a) is performed so that the panel on which the target PDP electrodes are printed is floated on an electrically conductive liquid with high specific gravity to allow a surface of the panel on which the PDP electrodes are printed to face upward, and the liquid is used as a ground
20 plane, thus converting the PDP electrodes to the transmission line structure.

5. The PDP electrode examination method according to claim 1, wherein the step a) is performed so that two
25 neighboring PDP electrodes are set to each electrode pair with

respect to the target PDP electrodes, and a first electrode of the electrode pair is set to a target electrode and a second electrode thereof is grounded according to set electrode pairs, thus converting the target PDP electrodes to the
5 transmission line structure.

6. The PDP electrode examination method according to claim 1, wherein the step b) comprises the steps of:

b1) providing a conduction line to commonly come into
10 contact with the plural target PDP electrodes printed on a single panel;

b2) applying an examination signal to a first end of the conduction line; and

b3) detecting frequency and phase characteristics of a
15 signal output from a second end of the conduction line opposite to the first end to which the examination signal is applied,

wherein the plurality of target PDP electrodes are simultaneously examined.

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7. The PDP electrode examination method according to claim 1, wherein the step b) is performed so that an examination signal is applied to a first end of each of the plurality of target PDP electrodes, and, simultaneously,
25 frequency and phase characteristics of an output wave are

detected through the first end thereof to which the examination signal is applied.

8. The PDP electrode examination method according to claim 1, wherein the examination signal applied at the step b) includes a plurality of frequency signals having a frequency interval (Δf), which is indicated in the following equation:

$$\Delta f = \frac{\Delta L}{4L(L - \Delta L)} \cdot \frac{c}{\sqrt{\epsilon_r}}$$

where L is a length of a PDP electrode, ΔL is a length variation of the PDP electrodes to be discriminated, c is a propagation speed of light, and ϵ_r is relative permittivity of a dielectric material forming a transmission line.

9. The PDP electrode examination method according to claim 1, wherein the step c) is performed so that positions of minimum points are checked from frequency characteristic results detected at the step b), and it is determined that defects are generated on the PDP electrodes if the checked positions of the minimum points are different from those of minimum points previously set in a normal state.

10. The PDP electrode examination method according to claim 1, wherein the step c) is performed so that positions of defective electrodes are detected using frequencies having

minimum points obtained from the frequency characteristic results detected at the step b).

11. The PDP electrode examination method according to
5 claim 1, wherein the step c) is performed so that the number of defective electrodes is determined using the number of minimum points obtained from the frequency characteristic results detected at the step b) and amplitudes at the minimum points.

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12. The PDP electrode examination method according to any of claims 1 to 5, further comprising the step of d) adjusting impedance of the target PDP electrodes to determine a division ratio of signals branched at a branch point to the examination
15 signal, thus adjusting examination sensitivity.

13. The PDP electrode examination method according to claim 6, wherein:

the step b1) is performed so that the conduction line is
20 provided to allow the plurality of target electrodes to have almost the same lengths ranging from a contact point of the conduction line and the target electrodes to first ends of respective electrodes; and

the step c) is performed so that it is determined whether
25 corresponding electrodes are defective by comparing positions

of minimum points at previously collected output waves of normal electrodes and the output waves of the target electrodes, converted to the transmission line structure, respectively, with each other.

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14. The PDP electrode examination method according to claim 6, wherein:

the step b1) is performed so that the conduction line is provided to allow target electrodes to have linearly varying
10 lengths ranging from a contact point of the conduction line and the target electrodes to first ends of respective PDP electrodes; and

the step c) is performed so that it is determined whether corresponding electrodes are defective and positions of
15 defective electrodes are detected by comparing patterns of output waves of normal electrodes and the output waves of the target electrodes with each other and analyzing them under the same conditions.

20 15. The PDP electrode examination method according to claim 12, wherein the step d) is performed so that the impedance of the target PDP electrodes is adjusted by adjusting type and thickness of dielectric material of the dielectric layer and thickness of the conduction line, or by
25 adjusting an interval between the ground plane and the PDP

electrodes.

16. The PDP electrode examination method according to claim 13, further comprising the step of detecting positions
5 of defective electrodes by examining electrodes determined to be defective at the step c) using a vision system.

17. An apparatus for examining PDP electrodes using frequency characteristics, comprising:

10 a target Plasma Display Panel (PDP) on which target electrodes are printed and a ground plane is formed to be spaced apart from the electrodes to convert the electrodes to a transmission line structure, and to which a conduction line is attached to come into contact with all of the electrodes;

15 a signal generator for generating an examination signal including a plurality of frequency signals;

a first impedance converter for matching impedance between the signal generator and the conduction line of the target PDP, and transmitting the examination signal to a first
20 end of the conduction line;

a peak detector for measuring amplitudes according to frequencies of an output wave output from a second end of the conduction line through the target electrodes; and

a second impedance converter for matching impedance
25 between the second end of the conduction line and the peak

detector and transmitting the output wave to the peak detector without reflection.

18. An apparatus for examining PDP electrodes using
5 frequency characteristics, comprising:

a target PDP on which target electrodes are printed and a ground plane is formed to be spaced apart from the electrodes to convert the electrodes to a transmission line structure;

a plurality of signal generators for generating
10 examination signals each including a plurality of frequency signals;

a plurality of first impedance converters disposed between the signal generators and the target electrodes printed on the PDP, respectively, to apply corresponding
15 examination signals to the respective target electrodes while matching impedance between the signal generators and the target electrodes;

a plurality of peak detectors for measuring amplitudes according to frequencies of respective output waves output
20 from the target electrodes printed on the PDP; and

a plurality of second impedance converters disposed between the target electrodes and the peak detectors, respectively, to transmit the output waves to the peak detectors without reflection.

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19. An apparatus for examining PDP electrodes using frequency characteristics, comprising:

a target PDP on which target electrodes are printed and a ground plane is formed to be spaced apart from the electrodes
5 to convert the electrodes to a transmission line structure;

a signal generator for generating an examination signal including a plurality of frequency signals;

a first impedance converter disposed between the signal generator and the target electrodes printed on the PDP to
10 transmit the examination signal to the target electrodes without reflection;

a peak detector for measuring amplitudes according to frequencies of output waves output from the target electrodes printed on the PDP;

15 a second impedance converter disposed between the target electrodes and the peak detector to transmit the output waves to the peak detector without reflection; and

a switch for connecting both the first and second impedance converters to one selected among the plurality of
20 target electrodes.

20. An apparatus for examining PDP electrodes using frequency characteristics, comprising:

a target PDP on which a plurality of target electrodes
25 are printed;

one or more switches respectively connected to adjacent electrodes printed on the PDP to alternately connect a corresponding electrode to first and second selection terminals of each of the switches, the second selection
5 terminal being grounded;

one or more signal generators for generating examination signals each including a plurality of frequency signals, the signal generators being connected to first selection terminals of the switches, respectively;

10 one or more first impedance converters disposed between the signal generators and the target electrodes to transmit the examination signals to the target electrodes without reflection;

one or more peak detectors connected to the first
15 selection terminals of the switches to measure amplitudes according to frequencies of output waves of the target electrodes, input through a corresponding switch; and

one or more second impedance converters disposed between the target electrodes and the peak detector to transmit the
20 output waves to the peak detector without reflection.